

of each switchboard and, if the switchboard is accessible from the rear, on the deck behind the switchboard.

(h) Each uninsulated current-carrying part must be mounted on non-combustible, nonabsorbent, high-dielectric insulating material.

(i) Equipment mounted on a hinged door of an enclosure must be constructed or shielded so that no person will come into accidental contact with energized parts of the door-mounted equipment when the door is open and the circuit energized.

(j) Switchboards and distribution panels must be sized in accordance with § 111.30-19(a) of this chapter.

§ 129.340 Cable and wiring.

(a) If individual wires, rather than cables, are used in systems operating at a potential of greater than 50 volts, the wire and associated conduit must be run in a protected enclosure. The protected enclosure must have drain holes to prevent the buildup of condensation.

(b) Each cable and wire must—

(1) Have stranded copper conductors with sufficient current-carrying capacity for the circuit in which it is used;

(2) Be installed so as to avoid or reduce interference with radio reception and compass indication;

(3) Be protected from the weather;

(4) Be supported so as to avoid chafing or other damage;

(5) Be installed without sharp bends;

(6) Be protected by metal coverings or other suitable means, if in areas subject to mechanical abuse;

(7) Be suitable for low temperature and high humidity, if installed in refrigerated compartments;

(8) Be located outside a tank, unless it supplies power to equipment in the tank; and

(9) Have sheathing or wire insulation compatible with the fluid in a tank, when installed to comply with paragraph (b)(8) of this section.

(c) Cable and wire in power and lighting circuits must be #14 AWG or larger. Cable and wire in control and indicator circuits must be #22 AWG or larger, or be ribbon cable or similar, smaller, conductor-size cable recommended by the equipment manufacturer for use in

circuits for low-power instrumentation, monitoring, or control.

(d) Cable and wire for power and lighting circuits must—

(1) Comply with Section 310-13 of the NEC (NFPA 70), except that no asbestos-insulated cable or dry-location cable may be used;

(2) Be listed by Underwriters Laboratories Inc. as UL Boat or UL Marine Shipboard cable; or

(3) Comply with § 111.60-1 of this chapter for cable, and § 111.60-11 of this chapter for wire.

(e) Cable and wire serving vital systems listed in § 128.130(a) of this subchapter or serving emergency loads must be routed as far as practicable from areas at high risk for fire, such as galleys, laundries, and machinery spaces.

(f) Cable or wire serving duplicated equipment must be separated so that a casualty that affects one cable does not affect the other.

(g) Each connection to a conductor or a terminal part of a conductor must be made within an enclosure and have a—

(1) Pressure-type connector on each conductor;

(2) Solder lug on each conductor;

(3) Splice made with a pressure-type connector to a flexible lead or conductor; or

(4) Splice soldered, brazed, or welded to a flexible lead or conductor.

(h) A connector or lug of the set-screw type must not be used with a stranded conductor smaller than No. 14 AWG, unless there is a nonrotating follower that travels with the set screw and makes pressure contact with the conductor.

(i) Each pressure-type wire connector and lug must comply with UL 486A. No wire nuts may be used.

(j) Each terminal block must have terminal screws 6-32 or larger.

(k) Each wire connector used in conjunction with screw-type terminal blocks must be of the captive type such as the ring or the flanged-spade type.

(l) No cable may be spliced in—

(1) A hazardous location; or

(2) Another location, except—

(i) A cable installed in a subassembly may be spliced to a cable installed in another subassembly;

(ii) For a vessel receiving alterations, a cable may be spliced to extend a circuit;

(iii) A cable of large diameter or exceptional length may be spliced to facilitate its installation.

(iv) A cable may be spliced to replace a damaged section of itself if, before replacement of the damaged section, the insulation resistance of the remainder of the cable is measured, and the condition of the insulation is unimpaired.

(m) All material in a cable splice must be chemically compatible with other material in the splice and with the materials in the cable.

(n) Ampacities for conductors must comply with Section 310-15 of the NEC (NFPA 70), or with IEEE Standard 45, as appropriate.

(o) Each conductor must be sized so that the voltage drop at the load terminals does not exceed 10 percent.

(p) Each metallic covering of armored cable must—

(1) Be electrically continuous; and

(2) Be grounded at each end of the run to the—

(i) Hull (on a metallic OSV); or

(ii) Common ground plate (on a non-metallic vessel); and

(3) Have final sub-circuits grounded at the supply end only.

(q) Each portable or temporary electric cord or cable must be constructed and used in compliance with the requirements of § 111.60-13 of this chapter for flexible electric cord or cable.

§ 129.350 Batteries—general.

(a) Wherever a battery is charged, there must be natural or induced ventilation to dissipate the gases generated.

(b) Each battery must be located as high above the bilge as practicable and be secured to protect against shifting due to roll, pitch, and heave motions or vibration of the OSV, and free from exposure to splash or spray of water.

(c) Each battery must be accessible for maintenance and removal.

(d) Each connection to a battery terminal must be made with a permanent connector, rather than with spring clips or other temporary clamps.

(e) Each battery must be mounted in a tray lined with, or constructed of,

lead or other material resistant to damage by the electrolyte.

(f) Each battery charger must have an ammeter connected in the charging circuit.

(g) Unless the battery is adjacent to a distribution panel or switchboard that distributes power to the lighting, motor, and appliance circuits, the battery leads must have fuses in series with and as close as practicable to the battery.

(h) Each battery used for starting an engine must be located as close as possible to the engine or engines served.

§ 129.353 Battery categories.

This section applies to batteries installed to meet the requirements of § 129.310(a) for secondary sources of power to vital loads.

(a) *Large.* A large battery-installation is one connected to a battery charger having an output of more than 2 kw, computed from the highest possible charging current and rated voltage of the battery installed.

(b) *Small.* A small battery-installation is one connected to a battery charger having an output of 2 kw or less, computed from the highest possible charging current and rated voltage of the battery installed.

§ 129.356 Battery installations.

(a) *Large.* Each large battery-installation must be located in a locker, room, or enclosed box dedicated solely to the storage of batteries. Ventilation must be provided in accordance with § 111.15-10 of this chapter. Electrical equipment located within the battery enclosure must be approved by an independent laboratory for hazardous locations of Class I, Division 1, Group B, and must meet part 111, subpart 111.105, of this chapter.

(b) *Small.* Each small battery-installation must be located in a well-ventilated space and protected from falling objects. No small battery-installation may be in a closet, storeroom, or similar space.

§ 129.360 Semiconductor-rectifier systems.

(a) Each semiconductor-rectifier system must have an adequate heat-removal system to prevent overheating.